

Claims

- [c1] A method for facilitating a fabrication of a high temperature superconducting electrical machine, said method comprising the steps of:
fabricating a back iron;
attaching a plurality of non-magnetic teeth to the back iron; and
installing the back iron in the machine.
- [c2] A method according to Claim 1 wherein said step of fabricating a back iron further comprises the step of fabricating a back iron having a plurality of tooth slots, said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a back section of each tooth to a tooth slot.
- [c3] A method according to Claim 1 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a plurality of non-magnetic teeth to the back iron with at least one key.
- [c4] A method according to Claim 3 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a plurality of non-magnetic teeth to the back iron with an adhesive.
- [c5] A method according to Claim 1 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a plurality of non-magnetic teeth comprising at least one of a glass laminate, a carbon fiber, and a fiber polymer to the back iron with at least one key.
- [c6] A method according to Claim 1 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching at least one non-magnetic tooth including at least one embedded conductor.
- [c7] A method for fabricating a stator with non-magnetic teeth, said method comprises the steps of:
fabricating a back iron; and
attaching a non-magnetic tooth back portion to the back iron.
- [c8] A method according to Claim 7 wherein said step of attaching a plurality of

non-magnetic teeth further comprises the step of attaching a substantially circular back portion unitary with the plurality of non-magnetic teeth to the back iron.

[c9] A method according to Claim 8 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a substantially circular back portion unitary with the plurality of non-magnetic teeth to the back iron with a key.

[c10] A method according to Claim 7 wherein said step of attaching a plurality of non-magnetic teeth further comprises the step of attaching a plurality of non-magnetic teeth comprising at least one of a glass laminate, a carbon fiber, and a fiber polymer to the back iron.

[c11] A method according to Claim 7 wherein said step of attaching a non-magnetic tooth back portion further comprises the step of attaching a non-magnetic tooth back portion including at least one embedded conductor to the back iron.

[c12] A stator comprising:
a back iron; and
a plurality of non-magnetic teeth unitary with a back portion, said back portion mounted on said back iron.

[c13] A stator according to Claim 12 wherein said back portion is substantially circular.

[c14] A stator according to Claim 13 further comprising at least one key extending from said back portion.

[c15] A stator according to Claim 12 wherein said back portion is mounted on said back iron with a key.

[c16] A stator according to Claim 12 wherein said non-magnetic teeth comprise at least one of a glass laminate, a carbon fiber, and a fiber polymer.

- [c17] A stator according to Claim 16 wherein at least one of said non-magnetic teeth comprises at least one embedded conductor.
- [c18] A dynamoelectric machine comprising:
a housing;
a stator comprising a bore therethrough mounted in said housing, said stator comprising a back iron and a plurality of non-magnetic teeth unitary with a back portion, said back portion mounted to said back iron;
a plurality of armature windings mounted on said teeth; and
a rotor rotatably mounted in said bore, said rotor comprising a plurality of field windings.
- [c19] A machine according to Claim 18 wherein said back section is substantially circular.
- [c20] A machine according to Claim 18 wherein said field windings are superconducting field windings.
- [c21] A machine according to Claim 20 further comprising:
a rotor jacket surrounding said field windings; and
a vacuum pump in flow communication with an interior of said rotor jacket.
- [c22] A machine according to Claim 21 further comprising a cryogenic cooler coupled to said rotor shaft.
- [c23] A machine according to Claim 18 wherein said field windings configured for synchronous operation with said armature windings.
- [c24] A machine according to Claim 18 wherein said back portion keyed to said back iron.
- [c25] A machine according to Claim 24 wherein said back portion adhesively bonded to said back iron.
- [c26] A machine according to Claim 18 wherein said non-magnetic teeth comprise at least one of a glass laminate, a fiber polymer, and a carbon fiber.

[c27] A machine according to Claim 18 wherein at least one of said non-magnetic teeth comprise at least one conductor.

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